



UNIVERSITÀ
DI TRENTO

Dipartimento di
Fisica



PhD Program in Space Science and Technology - SST

Technology of space tethered systems

Specific Seminar – Curriculum 6

2024, September 19, 3 p.m.

Speakers:

Enrico Lorenzini – Professor, Department of Industrial Engineering, University of Padova

Abstract:

Space tethers have been around for about 4 decades and even longer if we consider the earlier visionary proposal of a terrestrial Space Elevator. Tether technology has been tested in space several times with successes and in some cases mixed results. Nevertheless, the technology has been evolving steadily leading to systems that are now shorter, more efficient and more survival in space. This seminar covers the evolution of tethers-in-space technology focusing primarily on the main advancements made in electrodynamic tethers. This technology is completely “green” and consequently fits very well the new trend in space propulsion. The level of thrust that can be attained with electrodynamic tethers is much higher than that obtainable with other propellant-less alternatives (e.g. neutral drag sails) and consequently well suited for operations in the entire region of low Earth orbits. Moreover, electrodynamic tethers can work reversibly by either transforming orbital energy into electrical and mechanical energy (producing drag in this case) and vice-versa producing thrust. This reversibility leads to a broad range of applications in low Earth orbits and at some magnetosphere-bearing planets.

Short Bio:

Enrico C. Lorenzini is a Professor in the Department of Industrial Engineering of the University of Padova (Italy) since 2006 after having spent 21 years as staff scientist at the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts (USA). His research interests include Astrodynamics, Spacecraft Dynamics and Control; Conceptual design of space systems with a focus on Tethered Satellites. He is an AIAA Associate Fellow, an IEEE Member, an AIDAA (Italian Association of Aeronautics and Astronautics) Member, an Academic Editor of the International Journal of Aerospace Engineering. He has participated actively in five tethered satellite missions flown thus far and he is presently working on a project funded by the European Innovation Council aimed at the demonstration flight of a new-technology electrodynamic tether system for deorbiting non-operational spacecraft.

Online attendance:

<https://unipd.zoom.us/j/83730602908?pwd=vVnNAeUirDgUqXATCPmg1ol8gKL7XK.1>

Meeting ID: 837 3060 2908

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